COMMUNICATION SCHEME FOR REALIZING EFFECTIVE DATA
INPUT/SETUP IN COMPACT SIZE PORTABLE TERMINAL DEVICE
USING LOCALLY CONNECTED NEARBY COMPUTER DEVICE

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BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

The present invention relates to a communication
10 scheme using a portable terminal device and a computer
device having application program execution functions, and
more particularly, to a communication scheme using a
portable terminal device which is capable of carrying out
data communications by being connected to a first computer
15 network via a wireless telephone network, a radio base
station or a gateway server while carrying out data
communications by being connected to a second computer
network formed with a nearby computer device, and a
computer device that communicates with the portable
20 terminal device through the second computer network.

DESCRIPTION OF THE BACKGROUND ART

Due to the spread of portable telephones (cellular
telephones) and PCS (Personal Communication System)
25 terminals, communication services utilizing radio
communication systems are widely in use recently. Using
these portable telephones (cellular telephones) and PHS
terminals, communication services are provided by carrying
out radio communications with radio base stations and being
30 multiply connected to wired communication networks through
these base stations.

On the other hand, due to the spreading use of the
worldwide computer network called "Internet", various
information services on the Internet have been developed
35 recently.

In particular, the Internet telephone (IP telephone) in which IP (Internet Protocol) packets are formed from telephone voice (speech) data and communications are carried out through the Internet by taking an advantage of the fact that a communication cost is extremely low on the Internet compared with the conventional telephone network has been a focus of much attention. Typically, as shown in Fig. 23, Internet telephone gateways 206 for relaying between a voice telephone network 3 and the Internet 4 are provided inside telephone stations, for example, and communications between these gateways 206 are carried out via the Internet 4 such that even long distance calls can be realized by incurring only a fee required for connection to a nearest telephone station (or a nearest location of the Internet telephone gateway).

Also, it is easily expanded into a scheme in which cellular telephones or PHS terminals are operated as terminal nodes for IP communications, i.e., wireless portable Internet terminals. For instance, as shown in Fig. 24, it is possible to realize an IP communication system in which a router device 205 for managing a plurality of radio base stations 202 is provided and data exchanges with the Internet 4 are carried out as this router device 205 functions as a gateway to the Internet 4.

By constructing communication systems as described above, it becomes possible to transfer multimedia data in various formats including voice telephone. In particular, in the Internet, it is possible to transfer voices, still images, video images, data files of a specific application, etc., by forming IP packets according to the standardized protocol called TCP/IP (Transmission Control Protocol/Internet Protocol), and it is also possible to operate existing Internet applications (such as Web browser) on a wireless portable terminal.

Now, in the case of using various applications on a

wireless portable terminal in such an environment, because
the wireless portable terminal generally has a compact or
very compact body size, there arises a problem stemming
from the compact or very compact body size that a data
5   input interface for setting up application configuration
data or entering input data (such as URL (Uniform Resource
Locator) of a web site) has poor characteristic regarding
its convenience in use and handling. Obviously, it is
impossible to support a keyboard and a pointing device
10   (such as mouse) similar to those of the ordinary PC. In
order to rectify such a drawback, in the case of a portable
telephone, for example, a measure for enabling a single
hand operation of a compact terminal without requiring key
operations has been provided by supporting a special user
15   interface such as jog dial.
        As described, in the case of utilizing applications
such as Internet telephone, Web browser, email, etc., or
other applications such as word processor in order to
receive Internet services that handle Internet telephone,
20   multimedia data, etc., by using a wireless portable
terminal, when a wireless portable telephone that is
generally in a compact size is used as a terminal, it has
been very difficult to carry out the input/setup operations
for data input/setup of Internet home page address (URL)
25   data or various setup information, optional setup
information of a word processor, etc., because of the poor
handling of the input interface such as keyboard. Also, as
such a terminal is to be utilized while moving, there are
cases where it is necessary to update information such as
30   network parameters at a visited site, but it has also been
very difficult to carry out operations related to this
because of the poor handling caused by the inability to
freely use keyboard or mouse.
        In addition, there are cases where applications to be
35   operated on a wireless portable terminal are required to

make special parameter setups because of limitations on resources such as size and resolution of a display that are imposed by the wireless portable terminal, unlike the standard applications on a portable note PC or a desk top

5   PC. For this reason, when a user who normally uses the standard applications on the ordinary PC is going to shift to applications for the wireless portable terminal, even though it is desirable to make setups as close to those in the usual utilization environment as possible, there have

10 been cases where it is impossible to shift between platforms smoothly by copying the setup information directly.

15 SUMMARY OF THE INVENTION

     It is therefore an object of the present invention to provide a communication scheme for enabling improvement of handling of a user interface or omission of tedious

20 operations in a portable terminal device which has a function for connecting to a prescribed computer network and a function for executing application programs (especially those that are to be used by being connected to the prescribed computer network) but which is also

25 associated with a poor handling of a user interface because of its compact or very compact body size.

     It is another object of the present invention to provide a communication scheme for a computer device that supports a portable terminal device in order to enable

30 improvement of handling of a user interface or omission of tedious operations in the portable terminal device which has a function for executing application programs but which is also associated with a poor handling of a user interface because of its compact or very compact body size.

35   According to one aspect of the present invention there

is provided a portable terminal device, comprising: a
network connection unit configured to establish a
connection to a computer network; a local network
connection unit configured to establish a connection to a
5   local network different from the computer network, the
local network being a network locally defined among the
portable terminal device and at least one other computer
device; and a processing unit configured to obtain a
prescribed information regarding the computer network that
10   is necessary or utilizable in operating an application
program to be operated on the portable terminal device by
being connected to the computer network, from said at least
one other computer device connected to the portable
terminal device via the local network through the local
15   network connection unit, carry out a prescribed processing
for the application program according to at least a part of
the prescribed information, and execute the application
program by using a result of the prescribed processing and
being connected to the computer network through the network
20   connection unit.

    According to another aspect of the present invention
there is provided a computer device, comprising: a local
network connection unit configured to establish a
connection to a local network that is locally defined among
25   the computer device and a portable terminal device; and a
processing unit configured to return a reply containing an
identification information for identifying a specified type
of application program that exists in the computer device,
or a prescribed information related to said specified type
30   of application program, in response to a request received
from the portable terminal device via the local network
through the local network connection unit.

    According to another aspect of the present invention
there is provided a communication method of a portable
35   terminal device having a function for executing application

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programs and a function for establishing a connection to a computer network; establishing a connection to a local network different from the computer network, the local network being a network locally defined among the portable

5   terminal device and at least one other computer device; and obtaining a prescribed information regarding the computer network that is necessary or utilizable in operating an application program to be operated on the portable terminal device by being connected to the computer network, from

10   said at least one other computer device connected to the portable terminal device via the local network, and carrying out a prescribed processing for the application program according to at least a part of the prescribed information.

15   According to another aspect of the present invention there is provided a communication method of a computer device, comprising: establishing a connection to a local network that is locally defined among the computer device and a portable terminal device; and returning a reply

20   containing an identification information for identifying a specified type of application program that exists in the computer device, or a prescribed information related to said specified type of application program, in response to a request received from the portable terminal device via

25   the local network.

According to another aspect of the present invention there is provided a computer usable medium having computer readable program codes embodied therein for causing a computer to function as a portable terminal device, the

30   computer readable program codes include: a first computer readable program code for causing said computer to establish a connection to a computer network; a second computer readable program code for causing said computer to establish a connection to a local network different from

35   the computer network, the local network being a network

locally defined among the portable terminal device and at least one other computer device; and a third computer readable program code for causing said computer to obtain a prescribed information regarding the computer network that

5 is necessary or utilizable in operating an application program to be operated on the portable terminal device by being connected to the computer network, from said at least one other computer device connected to the portable terminal device via the local network, carry out a

10 prescribed processing for the application program according to at least a part of the prescribed information, and execute the application program by using a result of the prescribed processing and being connected to the computer network.

15 According to another aspect of the present invention there is provided a computer usable medium having computer readable program codes embodied therein for causing a computer to function as a computer device, the computer readable program codes include: a first computer readable

20 program code for causing said computer to establish a connection to a local network that is locally defined among the computer device and a portable terminal device; and a second computer readable program code for causing said computer to return a reply containing an identification

25 information for identifying a specified type of application program that exists in the computer device, or a prescribed information related to said specified type of application program, in response to a request received from the portable terminal device via the local network.

30 Other features and advantages of the present invention will become apparent from the following description taken in conjunction with the accompanying drawings.

35 BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic diagram showing an exemplary basic configuration of a network system according to one embodiment of the present invention.

5   Fig. 2 is a block diagram showing an exemplary internal configuration of a wireless portable terminal in the network system of Fig. 1.

Fig. 3 is a diagram showing an exemplary display of a typical Web browser that can be used in the network system

10   of Fig. 1.

Fig. 4 is a diagram showing an exemplary input interface that can be provided on the portable terminal device of Fig. 2.

Fig. 5 is a sequence chart showing an exemplary

15   message exchange sequence for obtaining bookmark data according to one embodiment of the present invention.

Figs. 6A and 6B are diagrams showing general formats and exemplary command field values of a query command and a reply command that can be used in one embodiment of the

20   present invention.

Figs. 7A and 7B are diagrams showing general formats and exemplary command field values of an application list notification command and an application list reply command that can be used in one embodiment of the present

25   invention.

Figs. 8A and 8B are diagrams showing general formats and exemplary command field values of a parameter list request command and a parameter list reply command that can be used in one embodiment of the present invention.

30   Fig. 9 is a diagram showing an exemplary display of an information setup for Internet connection in a typical Web browser that can be used in the network system of Fig. 1.

Fig. 10 is a sequence chart showing an exemplary message exchange sequence for obtaining Web browser setup

35   data according to one embodiment of the present invention.

Fig. 11 is a diagram showing an exemplary display of an option setup for a word processor that can be used in the network system of Fig. 1.

Fig. 12 is a sequence chart showing an exemplary message exchange sequence for obtaining Internet telephone numbers according to one embodiment of the present invention.

Fig. 13 is a sequence chart showing an exemplary message exchange sequence for obtaining email addresses according to one embodiment of the present invention.

Fig. 14 is a sequence chart showing an exemplary message exchange sequence for obtaining data for a plurality of applications collectively according to one embodiment of the present invention.

Fig. 15 is a schematic diagram showing an exemplary case where the portable terminal device carries out message exchanges with a plurality of nearby PCs according to one embodiment of the present invention.

Fig. 16 is a sequence chart showing one exemplary message exchange sequence for carrying out message exchanges with a plurality of nearby PCs according to one embodiment of the present invention.

Fig. 17 is a sequence chart showing another exemplary message exchange sequence for carrying out message exchanges with a plurality of nearby PCs according to one embodiment of the present invention.

Fig. 18 is a sequence chart showing another exemplary message exchange sequence for carrying out message exchanges with a plurality of nearby PCs according to one embodiment of the present invention.

Fig. 19 is a sequence chart showing another exemplary message exchange sequence for carrying out message exchanges with a plurality of nearby PCs according to one embodiment of the present invention.

Fig. 20 is a schematic diagram showing an exemplary

case of message transfer between two PCs using the portable
terminal device according to one embodiment of the present
invention.

Fig. 21 is a schematic diagram showing an exemplary
case of message transfer to a plurality of PCs using the
portable terminal device according to one embodiment of the
present invention.

Fig. 22 is a schematic diagram for explaining a
cooperation of the portable terminal device and another
computer device according to one embodiment of the present
invention.

Fig. 23 is a schematic diagram for explaining a
conventional Internet telephone network.

Fig. 24 is a schematic diagram for explaining a
conventional Internet wireless telephone network.

Fig. 25 is a block diagram showing an exemplary
internal configuration of a personal computer in the
network system of Fig. 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to Fig. 1 to Fig. 22, one embodiment of
the communication scheme according to the present invention
will be described in detail.

First, with reference to Fig. 22, the basic
configuration of this embodiment will be described.

Fig. 22 shows an exemplary network configuration
assumed in this embodiment, and a manner of utilization of
a wireless portable terminal according to this embodiment.
In this configuration of Fig. 22, the case where a wireless
portable terminal 1 carries out some communications with a
correspondent (not shown) will be considered.

The wireless portable terminal 1 has a function for
carrying out communications and other processing

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independently, but in this embodiment, the wireless portable terminal 1 also has a function for supporting a user interface by utilizing another computer. Another computer to be utilized can be a note PC (or may be a laptop PC or a desktop PC) carried around by a user who is carrying around the wireless portable terminal 1 as well, or a note PC, a laptop PC or a desktop PC that is located at a home, an office, or a public location at a visited site. The wireless portable terminal and PC are capable of carrying out local communications using a medium such as wireless LAN (Local Area Network), point-to-point wireless device (such as Bluetooth), or infrared (IrDA), for example. In addition, it is also possible to carry out IP communications.

This wireless portable terminal 1 exchanges various application setup information with a nearby PC through a local communication network in order to realize setup or configuration of applications operating on the own device, so as to enable smooth operations. Here, however, the exchanged data are further processed in order to account for a difference in a setup information format between applications operating on an ordinary PC and applications operating on the wireless portable terminal or to match a special user interface of the wireless portable terminal. For example, a prescribed processing for setup or configuration is carried out by using information obtained by carrying out a prescribed procedure with the nearby PC as follows.

(1) A mutual authentication is carried out with the cooperating PC.

(2) A type of application to be used is notified to the cooperating PC.

(3) A set of data necessary in activating the application such as standard application setup data, address list, etc., on the cooperating PC for the notified

application type, that are transmitted from the cooperating PC, are received.

(4) The received application activation information such as setup data and address list is converted into a format that matches with the own setup scheme or interface, and a control for automatic setup is carried out.

In this way, the handling of the wireless portable terminal can be supplemented. In particular, it becomes possible to provide an improved handling by taking full advantage of the input/output device unique to the wireless portable terminal.

In the following, this embodiment will be described in further detail.

Fig. 1 shows an exemplary basic configuration of a network according to this embodiment.

A wireless network, which is generally operated by a radio communication service provider or the like, accommodates wireless portable terminals 1 (1a to 1n in Fig. 1) using radio base stations 2 (2a to 2m in Fig. 1), and provides a service of communications among the wireless portable terminals 1 as well as a service of communications between the wireless portable terminal 1 and a telephone (not shown) accommodated in a telephone network 3. In addition, a router device 5 is provided, and a service of packet transfer from a wireless portable terminal 1 to an IP network such as Internet 4 and packet transfer from the IP network such as Internet 4 to the wireless portable terminal is provided by this router device 5 for packets containing voice data and other multimedia data that are transmitted from the wireless portable terminal 1.

On the other hand, the telephone network 3, which is generally operated by a communication service provider or the like, accommodates telephones (not shown), and provides a service of communications between a telephone and the wireless portable terminal 1. There are also cases where an

Internet telephone gateway (not shown) is provided in the telephone network 3, in which cases the Internet telephone service for transferring voice telephone data via the IP network is provided by the Internet telephone gateway.

5   It is assumed that a user is carrying around the wireless portable terminal 1 and one or a plurality of note PCs (8a to 8k of Fig. 1) which can cooperate with the wireless portable terminal 1. There are also cases where one or a plurality of PCs that can cooperate with the

10   wireless portable terminal 1 are provided at a visited site. Of course, it is also possible to utilize the PC at the visited site instead of having any node PC carried around by the user. There is no difference between the PC carried around by the user and the PC at the visited site

15   in terms of their operations. There is however a difference in that the PC carried around by the user is customized to that user whereas the PC at the visited site is customized to that visited site.

      Note that communications through the telephone network

20   3 are basically the same as the usual communications using a wireless portable telephone.

      Next, a configuration of the wireless portable terminal according to this embodiment will be described.

      Fig. 2 shows an exemplary internal configuration of a

25   wireless portable terminal according to this embodiment.

      This wireless portable terminal has a radio communication unit 11, a local network communication unit 12, a voice format processing unit 13, a TCP/IP processing unit 14, an A/D-D/A conversion unit 15, a voice

30   input/output processing unit 16, a display 17 as well as other input/output device, memory, etc. that are not shown in Fig. 2. This wireless portable terminal also has functions of usual wireless telephone or computer according to the need.

35   The radio communication unit 11 is an input/output

unit for carrying out communications with the wireless
telephone network through one of the radio base stations 2a
to 2m (that is selected according to the signal power, for
example), similarly as in the usual wireless telephone. On
5   the other hand, the local network communication unit 12 is
an interface for carrying out communications with the PCs
8a to 8k that are carried around by the user along with
this wireless portable terminal 1, using radio or infrared
(such as IrDA).

10   The voice format processing unit 13 carries out a
processing of voice telephone data. The voice telephone
data received from the wireless telephone network are
processed here and then sent to a voice input/output
processing unit 16.

15   On the other hand, voice packet data directly received
from the Internet 4 are received at the TCP/IP processing
unit 14, converted into analog data at the A/D-D/A
conversion unit 15, and then sent to the voice input/output
processing unit 16. Also, data other than voice data such
20   as image data, for example, that are received from the
Internet 4, are processed by appropriate dedicated
application at the TCP/IP processing unit 14, and outputted
to the display 17 according to the need.

        The display 17 is one associated with the body of the
25   wireless portable terminal device, which has inferior
output size and resolution compared with the other desktop
PC or node PC.

        Note that, as already mentioned above, the user is
assumed to be carrying around one or a plurality of PCs 8a
30   to 8k along with the wireless portable terminal 1 in this
embodiment. Here, a problem regarding security may arise if
communications are carried out unconditionally whenever
they are connected by the wireless/infrared network. For
this reason, it is preferable for the wireless portable
35   terminal 1 and the PC 8 to carry out communications after

carrying out the mutual authentication according to a cryptographic scheme and establishing an authenticated communication path, before mutually exchanging data through the local network using wireless LAN, point-to-point

5   wireless device or infrared.

This can be realized, for example, by a scheme in which A encrypts its own ID by using own secret key and transmits this encrypted ID to B and B that received the encrypted ID decrypts the encrypted ID by using a public

10   key of A, then B encrypts the decrypted ID by using own secret key and transmits the re-encrypted ID to A and A that received the re-encrypted ID decrypts the re-encrypted ID by using a public key of A to check if the re-decrypted ID is same as the original ID. In the case of carrying out

15   communications with a plurality of PCs through the local network, the similar authentication process is carried out with respect to each PC and as many authenticated communication paths as the number of PCs are generated, and then the necessary data exchanges are carried out. This

20   procedure is also applied in the case where the wireless portable terminal cooperates with the PC at the visited site.

In the following, several concrete examples of a manner by which the wireless portable terminal 1 utilizes

25   the nearby PC will be described.

Now, in the communications via the IP network, various application programs (abbreviated hereafter as applications) that have been developed conventionally for Internet or Intranet can be operated on the wireless

30   portable terminal 1. For example, a Web browser or a file transfer program can be used as they are. However, the wireless portable terminal 1 is generally in a compact size, so that sufficient resources cannot be allocated to the input/output device (such as mouse, keyboard, and

35   display, for example) for carrying out input/output of

parameters or data, and for this reason there are cases where a difficulty is encountered in carrying out input/setup of information that is to be carried out by using a keyboard or mouse in the applications for the usual
5   PCs.

In this embodiment, such a setup of information whose input is difficult at the wireless portable terminal 1 is compensated by data communications with the nearby PC or group of PCs.

10   First, an exemplary case of input/setup of a URL to be utilized by the Web browser from the PC8 will be described. Fig. 3 shows an exemplary display of a typical Web browser.

In the Web browser, when a WWW address is specified in a URL field 31, a request message in the http protocol is
15   issued to the Internet, and a page information obtained in response is displayed at a page display region 32. In order to make an input of this URL address, a means for inputting alphanumeric symbols is necessary, but the wireless portable terminal 1 in a compact size has a poor handling
20   regarding this input operation. On the other hand, there is a data called bookmark which holds a list of URLs that are frequently accessed. In the standard Web browser, an interface 33 for this bookmark data is also one in which each URL is to be selected from a menu using a mouse.

25   In the wireless portable terminal 1 having a constraint on the handling of the input/output device, it is possible to receive this bookmark data from the nearby PC8 and store it into a memory in a format matching with the interface unique to a compact terminal for the sake of
30   later use.

For example, consider a wireless portable terminal with a body 35 that provides an operation environment as shown in Fig. 4. In Fig. 4, using a combination of a jog dial 36 and push buttons 37, it is possible to make the
35   following operations: (1) a selection of a URL selection

mode by using push buttons 37; (2) a display of the
bookmark data received from the nearby PC at a liquid
crystal display 38 using the jog dial 36 (in which the URL
is switched one by one whenever the jog dial 36 is rotated
5   slightly, for example); and (3) a URL selection from the
bookmark by using the push buttons 37 again.

Here, it is necessary for the wireless portable
terminal 1 side to judge a type of the Web browser that
operates on the nearby PC 8 in communication and convert
10   the bookmark data into a prescribed format on the wireless
portable terminal 1 side according to the judged type. Fig.
5 shows an exemplary message exchange sequence for this
purpose.

First, a prescribed authentication procedure is
15   carried out between the wireless portable terminal 1 and
the nearby PC 8.

Next, when the authentication procedure succeeded, the
wireless portable terminal 1 obtains a program type of the
Web browser on the nearby PC 8. To this end, the wireless
20   portable terminal 1 transmits a Get-Web-Browser-Name
command, for example. Each command type will be described
in detail later.

In response, the nearby PC 8 returns a Reply-Web-
Browser-Name command attached with a program name of a Web
25   browser activated by the own device. For example, it is
notified that a Web browser with a program name of OOO
browser Ver. 3.0 is used.

The wireless portable terminal 1 that obtained the
reply containing the Web browser name then transmits a Get-
30   Web-Browser-Bookmark command.

In response, the nearby PC 8 returns a Reply-Web-
Browser-Bookmark command attached with the Bookmark data in
a prescribed format of that Web browser (OOO browser Ver.
3.0, for example).

35   The wireless portable terminal 1 takes out the URL

data attached to this Reply-Web-Browser-Bookmark command, converts it into a format usable in the own jog dial interface, and stores it into a prescribed memory. Namely, it becomes possible for the wireless portable terminal 1 to

5   upload and use the Bookmark data set up by the Web browser operating on the nearby PC 8.

This is convenient under a situation where the user is carrying around the usually used note PC along with the wireless portable terminal 1.

10   Note that, in the above procedure, the nearby PC 8 returns the Reply-Web-Browser-Name command containing an information indicating no Web browsers if the Web browser is not installed. Also, when the Reply-Web-Browser-Name command containing an information indicating no Web

15   browsers is received, the procedure is finished (and if there is another nearby PC, the above procedure is carried out with respect to that PC, for example).

Here, the command message formats to be used between the wireless portable terminal 1 and the nearby PC 8 can be

20   defined appropriately according to the required operations. Exemplary general formats of messages to be used in this embodiment are shown in Figs. 6A and 6B, 7A and 7B, and 8A and 8B.

Fig. 6A shows a general format of a query command to

25   be issued from the wireless portable terminal 1 side, and a list of command field values.

Fig. 6B shows a format of a reply command to be issued from the nearby PC 8 in response. An extension field is in a command dependent format which can be defined

30   appropriately.

Figs. 7A and 7B respectively show formats of an application list notification command (wireless portable terminal → nearby PC) and a corresponding application list reply command (nearby PC → wireless portable terminal) that

35   are to be used at a time of the collective setup to be

described below. The reply command returns NULL if no corresponding application is provided as will be described below.

Figs. 8A and 8B respectively show formats of a
5   parameter list request command (wireless portable terminal → nearby PC) and a corresponding parameter list reply command (nearby PC → wireless portable terminal) that are to be exchanged subsequent to the application list notification command and the application list reply command
10 of Figs. 7A and 7B.

Next, an exemplary case of input/setup of operation parameters to be set up in the Web browser from the PC8 will be described. Fig. 9 shows an exemplary information setup for the purpose of Internet connection in a typical
15 Web browser.

In an option setup screen 41 of this example, operation parameters of the Web browser such as a DNS name of a Proxy server and URLs to which the connection via the Proxy server is to be made are set up. In order to make an
20 input of these data, an input means is necessary but the wireless portable terminal 1 in a compact size has a poor handling regarding this setup operation.

In this embodiment, it is possible to make the browser parameter setup by receiving these Web browser setup
25 parameters from the nearby PC8 and storing them in a format matching with the browser of a compact terminal. Fig. 10 shows an exemplary message exchange sequence for this purpose.

First, a prescribed authentication procedure is
30 carried out between the wireless portable terminal 1 and the nearby PC 8.

Next, when the authentication procedure succeeded, the wireless portable terminal 1 transmits a Get-Web-Browser-Name command in order to obtain a program type of a Web
35 browser on the nearby PC 8, and receives a Reply-Web-

Browser-Name command attached with a program name of a Web browser activated on the nearby PC 8 from the nearby PC 8. For example, it is notified that a Web browser with a program name of OOO browser Ver. 3.0 is used.

5   The wireless portable terminal 1 that obtained this reply then transmits a Get-Web-Browser-Setup command.

In response, the nearby PC 8 returns a Reply-Web-Browser-Setup command attached with the browser setup data in a prescribed format of that Web browser (OOO browser

10   Ver. 3.0, for example).

The wireless portable terminal 1 takes out the setup parameters attached to this Reply-Web-Browser-Setup command, and stores them into an own browser setup data memory. Here, not necessary all the data are to be set up

15   in one-to-one correspondence, but it is preferable for the setup at the wireless portable terminal 1 to somehow reflect at least those parameters that are dependent on the network attributes at the current visited site. Namely, it becomes possible for the wireless portable terminal 1 to

20   upload and use the setup data of the Web browser operating on the nearby PC 8.

This is convenient under a situation where it is desired to use the same setup data as the PC that is set up at a visited site network (a branch, for example) in the

25   wireless portable terminal 1 at that network.

Note that, in the above procedure, the nearby PC 8 returns the Reply-Web-Browser-Name command containing an information indicating no Web browsers if the Web browser is not installed, similarly as in the previous example.

30   Also, when the Reply-Web-Browser-Name command containing an information indicating no Web browsers is received, the procedure is finished (and if there is another nearby PC, the above procedure is carried out with respect to that PC, for example).

35   Note also that the above description is directed to

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the case of Internet applications, but the present
invention is also applicable to general applications.

Next, an exemplary case of input of option setup data
to be set up in the word processor from the PC8 will be
5   described. Fig. 11 shows an exemplary option setup in a
word processor used in the standard PC.

In an option setup screen 46 of this example, many
option setups such as letter form, presence/absence of
editorial symbol display, presence/absence of status bar or
10 scroll bar display, etc., can be made. In order to make an
input of these data, an input means is necessary but the
wireless portable terminal 1 in a compact size has a poor
handling regarding this setup operation.

In this embodiment, it is possible to make the word
15 processor option parameter setup by receiving these word
processor option set up parameters from the nearby PC8 and
storing them in a format matching with the word processor
of a compact terminal. The message exchange sequence for
this purpose is basically the same as that of Fig. 10.

20 First, a prescribed authentication procedure is
carried out between the wireless portable terminal 1 and
the nearby PC 8.

Next, when the authentication procedure succeeded, the
wireless portable terminal 1 obtains a program type of a
25 word processor on the nearby PC 8. To this end, the
wireless portable terminal 1 transmits a Get-Word-
Processor-Name command.

In response, the nearby PC 8 returns a Reply-Word-
Processor-Name command attached with a program name of a
30 word processor activated on the own device. For example, it
is notified that a word processor with a program name of
OOO word processor Ver. 8.0 is used.

The wireless portable terminal 1 that obtained this
reply then transmits a Get-Word-Processor-option command.
35 In response, the nearby PC 8 returns a Reply-Word-

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Processor-option command attached with the option data in a
prescribed format of that word processor (OOO word
processor Ver. 8.0, for example).

The wireless portable terminal 1 takes out the option
5   data attached to this Reply-Word-Processor-option command,
and stores them into an own word processor setup data
memory. Here, if items of the option data of the wireless
portable terminal 1 and items of the option data of the
nearby PC 8 are not in one-to-one correspondence, only
10   corresponding ones may be reflected, or convertible ones
may be reflected after the conversion.

In this way, it becomes possible to make the operation
mode setup easily by entering the setup data unique to the
application into the wireless portable terminal 1 side by
15   uploading from the nearby PC 8.

This is convenient under a situation where the user is
carrying around the usually used note PC along with the
wireless portable terminal 1.

Note that, in the above procedure, the nearby PC 8
20   returns the Reply-Word-Processor-Name command containing an
information indicating no word processors if the word
processor is not istalled, similarly as in the previous
example. Also, when the Reply-Word-Processor-Name command
containing an information indicating no word processors is
25   received, the procedure is finished (and if there is
another nearby PC, the above procedure is carried out with
respect to that PC, for example).

Next, an exemplary case of retrieval of a telephone
number of an Internet telephone from telephone number data
30   stored in the nearby PC8 will be described. Fig. 12 shows
an exemplary message exchange sequence in this case.

First, a prescribed authentication procedure is
carried out between the wireless portable terminal 1 and
the nearby PC 8.

35   Next, when the authentication procedure succeeded, the

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wireless portable terminal 1 obtains a program type of an Internet telephone on the nearby PC 8. To this end, the wireless portable terminal 1 transmits a Get-IPtel-Name command.

5   In response, the nearby PC 8 returns a Reply-IPtel-Name command attached with a program name of an Internet telephone activated on the own device.

The wireless portable terminal 1 that obtained this reply then transmits a Get-IPtel-numbers command.

10   In response, the nearby PC 8 returns a Reply-IPtel-numbers command attached with the telephone numbers of the Internet telephone.

The wireless portable terminal 1 takes out the telephone numbers of the Internet telephone attached to

15   this Reply-IPtel-numbers command, and stores them into an own Internet telephone setup data memory.

In this way, it becomes possible to provide a comfortable utilization environment in which the limitations on the handling of the input/output device, and

20   the local communication amount between the wireless portable terminal and the nearby PC are compensated.

Note that, in the above procedure, the nearby PC 8 returns the Reply-IPtel-Name command containing an information indicating no Internet telephones if the

25   Internet telephone is not installed, similarly as in the previous example. Also, when the Reply-IPtel-Name command containing an information indicating no Internet telephones is received, the procedure is finished (and if there is another nearby PC, the above procedure is carried out with

30   respect to that PC, for example).

Next, an exemplary case of retrieval of a mail address of an email handler from data stored in the nearby PC8 will be described. Fig. 13 shows an exemplary message exchange sequence in this case.

35   First, a prescribed authentication procedure is

carried out between the wireless portable terminal 1 and the nearby PC 8.

Next, when the authentication procedure succeeded, the wireless portable terminal 1 obtains a program type of an email handler on the nearby PC 8. To this end, the wireless portable terminal 1 transmits a Get-Mailer-Name command.

In response, the nearby PC 8 returns a Reply-Mailer-Name command attached with a program name of an email handler activated on the own device.

The wireless portable terminal 1 that obtained this reply then transmits a Get-Mailer-addresses command.

In response, the nearby PC 8 returns a Reply-Mailer-addresses command attached with the mail addresses of the email handler.

The wireless portable terminal 1 takes out the mail addresses of the email handler attached to this Reply-Mailer-addresses command, and stores them into an own email setup data memory.

In this way, it becomes possible to provide a comfortable utilization environment in which the limitations on the handling of the input/output device, and the local communication amount between the wireless portable terminal and the nearby PC are compensated.

Note that, in the above procedure, the nearby PC 8 returns the Reply-Mailer-Name command containing an information indicating no email handlers if the email handler is not installed, similarly as in the previous example. Also, when the Reply-Mailer-Name command containing an information indicating no email handlers is received, the procedure is finished (and if there is another nearby PC, the above procedure is carried out with respect to that PC, for example).

In each of the above procedures, when the Reply-***-Name command is received from the nearby PC8, the wireless portable terminal 1 may judge whether information regarding

the application with a program name notified from the
nearby PC 8 is utilizable on the own device or not and
interrupt the subsequent procedure when it is not
utilizable on the own device even if it is acquired.

5   Also, in each of the above procedures, the nearby PC 8
may notify a program name of a resembling application if
the corresponding application does not exist but a
resembling application exists. In this case, the wireless
portable terminal 1 may judge whether information regarding
10 the application with a program name notified from the
nearby PC 8 is utilizable on the own device or not and
interrupt the subsequent procedure when it is not
utilizable on the own device even if it is acquired.

      Also, in each of the above procedures, a specified
15 application program name may be included in the Get-***
command transmitted from the wireless portable terminal 1
to the nearby PC 8 and the nearby PC8 may return a reply
containing an information indicating whether an application
corresponding to the specified application program name
20 exists or not. Also, in this case, the nearby PC 8 may
notify a program name of a resembling application if an
application corresponding to the specified application
program name does not exist but a resembling application
exists, in addition to the information indicating whether
25 an application corresponding to the specified application
program name exists or not. The same remarks as above also
apply thereafter.

      Also, if the corresponding application does not exist
but a resembling application exists, the nearby PC 8 may
30 judge whether an information regarding that resembling
application is utilizable at the request source wireless
portable terminal 1 or not according to information
registered in advance, and carry out the notification only
when it is utilizable.

35   Besides these, many variations of the above procedures

are possible.

Next, an exemplary case where the wireless portable terminal 1 has a plurality of applications which can utilize the nearby PC will be described.

5   In the case of automatically carrying out the setup or the like for two or more applications by utilizing the nearby PC, basically the following two methods are possible in terms of exchanges with PC.

    (1) All (or a part of a plurality of) application data
10 to be installed are obtained from the nearby PC at a timing where the wireless portable terminal is activated.

    (2) Data regarding each individual application is obtained from the nearby PC at a timing where each individual application is activated after the activation of
15 the wireless portable terminal.

    In the following, the latter method will be described first.

    The method for obtaining necessary data at a time of the application activation basically amounts to carrying
20 out the message exchanges such as those shown in Fig. 5 or Fig. 10 individually for each application that is installed on the wireless portable terminal 1 and for which the data uploading from the nearby PC 8 is necessary. Namely, the message exchanges and the data acquisition are carried out
25 by the following steps for each application.

    (Step 1) The exchange of mutual authentication messages are carried out between the wireless portable terminal and the nearby PC.

    (Step 2) Name and version of application operating on
30 the nearby PC are inquired from the wireless portable terminal and a reply is obtained.

    (Step 3) Necessary setup data and input data are inquired to the nearby PC, and reply data are obtained.

    (Step 4) Necessary information is extracted from the
35 reply data and set into a prescribed memory region.

As a method for selecting target applications of this procedure, it is possible to register application programs to be set up by utilizing the nearby PC and information to be set up by utilizing the nearby PC for each application program in a form of a list information in the wireless portable terminal 1. Else, instead of carrying out the above registration, all the applications installed on the wireless portable terminal 1 may be taken as targets.

This method is effective in cases where there are many types of applications to be handled or cases where an amount of data to be set up for one application is large (although the message exchange procedure will be required at a time of activation of the individual application).

Next, the case of obtaining a plurality of application data from the nearby PC at a timing of the activation of the wireless portable terminal will be described.

When the number of applications installed on each wireless portable terminal 1 is limited, it is possible to consider a method in which the setup data for all the applications are obtained from the nearby PC and set at a timing of the activation of the wireless portable terminal 1.

Fig. 14 shows an exemplary message exchange sequence for this case, under the assumption that only the Web browser and the mail client are installed on the wireless portable terminal 1 (or only these two utilize the nearby PC).

As a method for selecting target applications of this procedure, it is possible to register application programs to be set up at a time of the activation by utilizing the nearby PC and information to be set up by utilizing the nearby PC for each application program in a form of a list information in the wireless portable terminal 1. In this example, the Web browser and the mail client are registered, and the setup parameters and the URL are

registered for the Web browser while the mail address list is registered for the mail client. Else, instead of carrying out the above registration, all the applications installed on the wireless portable terminal 1 may be taken as targets.

When the wireless portable terminal 1 is activated, the procedure enters into the authentication phase similar to that in the case of Fig. 5 or Fig. 10.

When the authentication with the nearby PC 8 is completed, the wireless portable terminal 1 transmits a Notify-Application-List command in order to notify a list of applications operating on the own device to the nearby PC 8.

In response, a Reply-Application-List command attached with a program name and a version number of each application operated on the nearby PC 8 that corresponds to the notified application is received from the nearby PC 8. For example, OOO browser Ver. 3.0 and OOO mail are notified.

Here, if the corresponding application is not installed, a reply is returned by inserting a NULL field. The detail of the error processing with respect to this NULL field is system dependently defined at each system.

The wireless portable terminal 1 that obtained the reply then transmits a Get-Parameter-List command.

In response, the nearby PC 8 returns a Reply-Parameter-List command attached with the browser setup data, the URL list and the mail address list in a prescribed format of these Web browser and mail client (OOO browser Ver. 3.0 and OOO mail, for example).

The wireless portable terminal 1 takes out the setup parameters, the URL list and the mail address list attached to this Reply-Parameter-List command, and stores them into the own browser and mail client setup data memories.

This procedure is effective when only the limited

amount of setup data and input data are to be uploaded for a relatively few types of applications because it becomes possible to activate the applications by carrying out the uploading only once at a time of the activation of the

5 wireless portable terminal 1 without requiring any subsequent message exchanges.

Note that it is possible to use both the method (1) for carrying out the above procedure for a plurality of application data at a timing of the activation of the

10 wireless portable terminal and the method (2) for carrying out the above procedure for each individual application at a timing of the activation of each individual application as described above. It is also possible to carry out the above procedure at a timing of the activation of the

15 wireless portable terminal for some one or plurality of application programs while carrying out the above procedure at a timing of the activation of each individual application for the other one or plurality of application programs.

20 It is also possible to enable a user to manually activate the procedure for obtaining a desired information of a desired application program from the nearby PC.

Up to this point, the cases of cooperation with one nearby PC has been described, but in general, there are

25 also cases where a plurality of nearby PCs and the wireless portable terminal can communicate via the local link (radio/infrared). Fig. 15 shows an exemplary case of this kind.

In this example, it is assumed that PCs #1 to #3 are

30 capable of communicating with the wireless portable terminal 1 via the wireless LAN. It is also assumed that the authentication process between each PC and the wireless portable terminal 1 has already been completed.

In this case, suppose that the inquiry/receiving/setup

35 of the Web browser setup parameters as shown in Fig. 10 are

to be made. Fig. 16 shows an exemplary message exchange sequence in this case.

In this case, a Get-Web-Browser-Name command is transmitted by broadcast to a plurality of nearby PCs, for example, and a Reply-Web-Browser-Name command is received from each nearby PC. Then, a PC on which the Web browser that can provide information close to the setup data of the Web browser on the wireless portable terminal 1 is installed (which is PC #2 in this example) is selected in view of each reply, and thereafter Get/Reply-Web-Browser-Setup commands are exchanged with this selected PC.

On the other hand, in the case of inquiring Bookmark data as in the case shown in Fig. 5, the inquiry is made by broadcast until the Bookmark data is actually received, and a PC that replied the Bookmark data containing a desired URL data is selected, as shown in Fig. 17.

Also, in the case of collective setup as in the case shown in Fig. 14, a Notify-Application-List command is transmitted by broadcast, and a Reply-Application-List command is received from each nearby PC similarly as shown in Fig. 18. At this point, a PC on which a group of applications that are closest to those installed on the wireless portable terminal 1 are installed (which is PC #2 in this example) is selected, and thereafter the message exchanges with this selected PC are carried out.

Else, as shown in Fig. 19, it is also possible to inquire desired parameter data individually from a plurality of PCs (PC #1 and PC #2 in this example) in view of the contents of the received Reply-Application-List commands.

It is also possible to assign priority orders among a plurality of nearby PCs and control to select a parameter to be selected according to the priority orders.

The above described embodiment is mainly aimed at the transfer of application setup data and input data to the

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wireless portable terminal 1, but the present invention can also be applied to the cooperation between the wireless portable terminal 1 and the nearby PC 8 for the other purpose. In the following, some exemplary cases of such an

5   application of the present invention will be described. For example, as shown in Fig. 20, it is possible to once upload the application setup data on a PC (#1) that is connected with the wireless portable terminal 1 by a wireless LAN, point-to-point wireless device or infrared

10   network, then move this wireless portable terminal 1 to another place and transfer that application setup data (as uploaded or as processed in the wireless portable terminal 1) into a PC (#2) that is connected with this wireless portable terminal 1 by a wireless LAN, point-to-point

15   wireless device or infrared network at that another place. This is effective under a situation where PC (31) or PC (#2) has no network connection other than the local network.

       Any suitable procedure may be used for this transfer

20   from the wireless portable terminal 1 to the PC (#2), but it is also possible to utilize the commands described above.

       For instance, in the example of Fig. 9 and Fig. 10, after the wireless portable terminal 1 obtained the setup

25   data from the PC (#1) by the procedure of Fig. 10, a prescribed authentication procedure is carried out between the wireless portable terminal 1 and the PC (#2).

       Then, when the authentication procedure succeeded, the wireless portable terminal 1 transmits a Get-Web-Browser-

30   Name command in order to obtain a program type of the Web browser on the PC (#2), and receives a Reply-Web-Browser-Name command from the PC (#2).

       Then, if the same program name as the Web browser program name corresponding to the setup data obtained

35   earlier by the own device is attached to the received

command, the wireless portable terminal 1 transmits a prescribed command (Upload-Web-Browser-Setup command, for example) attached with that setup data to the PC (#2). In this case, it is known in advance that the data transfer

5 between PC #1 and PC #2 is the main purpose, so that there is no need to set the parameters into the Web browser on the wireless portable terminal 1.

It is also possible to use a configuration in which the application install/setup information is distributed to

10 the PCs 8 by using the wireless portable terminal 1, as shown in Fig. 21, for example. In this case, the application install data or its setup information can be stored into the wireless portable terminal 1 via some network (a local network such as wireless LAN, point-to-

15 point wireless device or infrared network, or Internet, for example) or via an input device of the wireless portable terminal 1 (such as manual input, for example), and these stored data can be installed and set up via the local network at some group of PCs located nearby the visited

20 site.

Fig. 25 shows an exemplary internal configuration of the PC 8 in this embodiment, which operates with the wireless terminal device 1. The PC 8 has two types of network interfaces including a local network interface 82

25 used for the communication with the wireless device and other network interfaces 81 which are conventional network interfaces such as those for telephone line and/or Ethernet. The PC 8 also has a TCP/IP processing unit 83 connected with these network interfaces 81 and 82, and a

30 local network command process unit 84 connected with the TCP/IP processing unit 83. The PC 8 also has application programs such as a Browser 85, a word processor 86, and a Mailer 87, each of which is connected with the TCP/IP processing unit 83 and the local network command process

35 unit 84.

The commands from wireless devices are transferred using conventional TCP/IP protocol, but with specific data format. For example, special TCP/UDP port can be assigned for the commands, or special data types can be defined for the commands from wireless devices. In Fig. 25, it is assumed that the special data types are defined. The TCP/IP processing unit 83 sends the command to the local network command process unit 84 upon recognizing the special data type. The local network command process unit 84 parses the command and communicates with the relevant application programs, in order to return appropriate response message. When the response message is constructed, the message is sent through the TCP/IP processing unit 83 and the local network interface 82.

As described, according to this embodiment, even in a compact or very compact wireless portable terminal which has a poor input interface handling, it is possible to make input/setup of application setup data and input data easily by effectively utilizing data exchanges via the local network with the nearby PCs at the visited site. In addition, it also becomes easily possible to distribute data stored in the wireless portable terminal to the nearby PCs or transfer data between the nearby PCs by utilizing the wireless portable terminal as a temporary storage. For example, a system manager can carry around a wireless portable terminal in which the application install information is stored, and install necessary programs into each PC in each room via the local network one by one.

As described above, the present invention is directed to a communication scheme of a portable terminal device having an application program execution function, in which the portable terminal device is connected with at least one computer device via a local network, a prescribed information necessary in operating an application program

(which can be almost any application program such as Web browser, Internet telephone, email handler, word processor, etc.) to be operated on the own device is obtained from a part or a whole of the connected computer devices, and a

5 prescribed processing necessary in operating the application program is carried out on at least a part of the obtained information. Here, the prescribed information can be information which is either necessary or preferably available for the purpose of the activation or setup of the

10 application program, or source of such an information (information that requires conversion of data format or the like in order to become utilizable, for example), for example. More specifically, this prescribed information can be given by a variety of data such as option data regarding

15 network connection, option data regarding proxy server, Internet telephone number, email address, URL Bookmark data, option data of word processor, etc. Also, the prescribed processing can be a processing for storing the obtained information into a prescribed memory region (a

20 memory region corresponding to the corresponding parameter, for example) as received or after the conversion of that information.

According to the present invention, it becomes possible to improve handling of a user interface or omit

25 tedious operations in a portable terminal device by cooperating the computer device with the portable terminal device,

Also, according to the present invention, it becomes possible to realize smooth operations by cooperation with

30 the nearby computer device even in a compact or very compact (wireless) portable terminal device on which input interface such as keyboard or mouse cannot be provided, by providing a mechanism (communication port, for example) for connection to a nearby computer device via a local network

35 (communication mechanism such as radio/infrared, for

example) in the (wireless) portable terminal device,
sending data or commands regarding application program to
the nearby computer device via the local network, receiving
identification information, input data information, etc.,
5   of a specified application (or application that has
resembling operation as the specified application) that is
operating on the nearby computer device, and automatically
setting the received data either as received or as
processed for the own application program according to the
10 need at the (wireless) portable terminal device.

Also, according to the present invention, it becomes
possible to operate the user interface of the (wireless)
portable terminal device more user friendly by uploading
URL data stored in the node PC carried around by the user
15 into the (wireless) portable terminal device whenever
appropriate and caching it into the own Web browser address
register for the later use, for example.

Also, according to the present invention, for the
purpose of transfer of setup data between two (fixed)
20 computers, data can be given from the first computer to the
(wireless) portable terminal device via the local network
once, and then the data can be given from the (wireless)
portable terminal device to the second computer similarly
via the local network, for example.

25 Also, according to the present invention, a system
manager can carry around the (wireless) portable terminal
device in which the application program install information
is stored, and install necessary programs into each
computer in each room via the local network one by one.

30

It is also to be noted that the above described
embodiments according to the present invention may be
conveniently implemented using a conventional general
purpose digital computer programmed according to the
35 teachings of the present specification, as will be apparent

to those skilled in the computer art. Appropriate software coding can readily be prepared by skilled programmers based on the teachings of the present disclosure, as will be apparent to those skilled in the software art.

5   In particular, each of the wireless portable terminal device and the nearby computer device of the above described embodiment can be conveniently implemented in a form of a software package.

Such a software package can be a computer program
10 product which employs a storage medium including stored computer code which is used to program a computer to perform the disclosed function and process of the present invention. The storage medium may include, but is not limited to, any type of conventional floppy disks, optical
15 disks, CD-ROMs, magneto-optical disks, ROMs, RAMs, EPROMs, EEPROMs, magnetic or optical cards, or any other suitable media for storing electronic instructions.

It is also to be noted that, besides those already mentioned above, many modifications and variations of the
20 above embodiments may be made without departing from the novel and advantageous features of the present invention. Accordingly, all such modifications and variations are intended to be included within the scope of the appended claims.

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